Paper No. 34

UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE BOARD OF PATENT APPEALS
AND INTERFERENCES

Ex parte PETER HOFER,
PETER HAGMANN, ROLAND HAUCK,
WOLFGANG GEISSLER,
and HUBERT LUTZ

Appeal No. 1998-0628
Application 08/197,100[1]

ON BRIEF

Before HAIRSTON, BARRETT, and RUGGIERO, Administrative Patent Judges.

[1] Application for patent filed February 14, 1994, entitled "Process And Apparatus For Examining Optical Components, Especially Optical Components For The Eye And Device For Illuminating Clear-Transparent Test Objects," which is a continuation of Application 07/810,636, filed December 18, 1991, now abandoned, which claims the foreign filing priority under 35 U.S.C. § 119 of Swiss Application 4032/90-7, filed December 19, 1990, and Federal Republic of Germany Application P4124003.0, filed July 19, 1991.

BARRETT, Administrative Patent Judge.

DECISION ON APPEAL

This is a decision on appeal under 35 U.S.C. § 134 from the final rejection of claims 25-37 and 39-44. Claim 38 is indicated to be allowable if rewritten to overcome the 35 U.S.C. § 112 rejection and to include all of the limitations of the base and intervening claims.

We affirm-in-part.

BACKGROUND

The disclosed invention is directed to an apparatus and method for examining transparent optical components, such as contact lenses.

Claim 30 is reproduced below.

> 30. An apparatus for examining a transparent optical component, comprising:
>
> an optical image-producing device being provided with a dark-field illumination means, the dark-field illumination means illuminating the component and the optical image-producing device receiving the light transmitted through the component the image-producing device recording a two-dimensional high-contrast image of the whole component to be examined at one single time and then displaying said image; and
>
> an image-processing device having an image-recording means with an image-sensor for area

determination of the flaws detected in the high-contrast image.

The Examiner relies on the following prior art references:

Richards	2,332,668	October 26, 1943
Remy et al. (Remy)	3,894,806	July 15, 1975
Wagner	4,681,442	July 21, 1987
Fitzmorris et al. (Fitzmorris)	4,691,231	September 1, 1987
Schmalfuss et al. (Schmalfuss)	4,841,139	June 20, 1989

Claims 44, 25-27, and 30-34 stand rejected under 35 U.S.C. § 103(a) as being unpatentable over Schmalfuss and either Remy or Wagner.

Claims 28 and 29 stand rejected under 35 U.S.C. § 103(a) as being unpatentable over Schmalfuss, Fitzmorris, and either Remy or Wagner.

Claims 35-37 and 39-43 stand rejected under 35 U.S.C. § 103(a) as being unpatentable over Schmalfuss, Richards, and either Remy or Wagner.

We refer to the Final Rejection (Paper No. 25) and the Examiner's Answer (Paper No. 32) (pages referred to as "EA__") for a statement of the Examiner's position, and to the Appeal

Brief (Paper No. 31) (pages referred to as "Br__") for Appellants' arguments thereagainst.

OPINION

Claims 30-37 and 39-43 stand or fall together with claim 30. Claims 44 and 25-29 stand or fall together with claim 44.

Claims 30-37 and 39-43

Initially, we interpret the phrase "for area determination of the flaws detected in the high-contrast image" in claim 30 as a statement of intended use. Statements of intended use are not structural limitations that distinguish over the prior art. See In re Pearson, 494 F.2d 1399, 1403, 181 USPQ 641, 644 (CCPA 1974); In re Yanush, 477 F.2d 958, 959, 177 USPQ 705, 706 (CCPA 1973); In re Casey, 370 F.2d 576, 580, 152 USPQ 235, 238 (CCPA 1967). While, perhaps, we could interpret the "image-processing device . . . for area determination of the flaws detected in the high-contrast image" as a means-plus-function limitation because the "device" does not recite any structure for performing the function, since claim 30 uses "means" elsewhere, it is presumed that limitations not using

"means" are not intended to be in means-plus-function format. Our interpretation is consistent with dependent claim 33 which recites an "area determination means," indicating that the structure for performing the function is not recited in claim 30. Appellants do not argue the area determination limitation of claim 30.

Schmalfuss discloses testing transparent components, such as optical or ophthalmic lenses, for flaws, particularly surface flaws (col. 1, lines 13-17). However, Schmalfuss uses dot scanning and does not disclose (1) dark-field illumination, and (2) recording an image of the whole component at one single time.

Remy discloses testing transparent containers, such as bottles, using dark-field illumination (col. 2, lines 38-41) and recording an image of the "container or its regions" (col. 4, line 14) on a detector comprising an array of photocells (right side of figure 1) or a picture scanning tube (Vidicon tube) (left side of figure 1) (col. 4, lines 12-36). The scanned output is connected to a logical circuit 24 which compares the output to a threshold to provide a control signal and which may have signal processing circuits (col. 4, line 53

to col. 4, line 3). Remy discloses that this is an improvement over the time-consuming prior art wherein the container was only illuminated in spots and regions and that the regions have to be illuminated successively by rotating the beam during measurement (col. 2, lines 10-33).

Wagner discloses testing the surface of a transparent object, such as a photolithographic mask. Wagner indicates that the method is useful for inspection of optical surfaces and polished wafer surfaces (col. 1, lines 12-13). The method uses dark-field illumination and recording the image by a television camera for subsequent digital image processing (col. 2, lines 5-19). An alternative method uses laser scanning (figure 3 and corresponding description).

We do not agree with the Examiner's reasoning about modifying Schmalfuss to use the dark-field illumination system of Remy or Wagner. The whole system in Schmalfuss is based on the dot scanning method and substituting the dark-field illumination system would destroy the reference. Nevertheless, the rejection is based on the collective teachings of the references and we conclude that the

references as a whole would have suggested the obviousness of the broad claim 30.

The difference between Remy and the subject matter of claim 30 is that Remy does not test "transparent optical components." However, one of ordinary skill in the art, seeking a solution to the problem of detecting defects in the surface of transparent optical components would have looked to the general field of testing the surfaces of transparent objects for a solution and found Remy. It would have been obvious to one of ordinary skill in the art to apply the dark-field illumination and imaging apparatus of Remy to the testing of "optical components" as disclosed in Schmalfuss because Remy discloses that taking an image of an area at one time eliminates the need to rotate the beam to sequential spots (col. 2, lines 10-19).

There are no clear differences between Wagner and the subject matter of claim 30 because Wagner suggests that the apparatus can be used for the inspection of "optical surfaces" and because the processing is not recited in claim 30. One of ordinary skill in the art would have been motivated to apply the testing apparatus of Wagner to the testing of "optical

components" as disclosed in Schmalfuss because Wagner discloses that the apparatus can be used for optical surfaces.

Appellants argue that there is no suggestion to combine the beer bottle inspection teachings of Remy or the photolithographic mask inspection teachings of Wagner with Schmalfuss (Br5).

While we agree that there is no suggestion to combine the references in the manner stated by the Examiner, we conclude that there is a suggestion to combine in the manner discussed supra.

Appellants argue that a person of ordinary skill in the opthalmic lens art would not have looked to the beer bottle inspection art of Remy or the photolithographic-related process of Wagner (Br5).

We disagree. Remy and Wagner are at least within the prior art related to the inventors' problem of detecting and measuring defects in transparent objects and, so, are analogous prior art.

It is argued that combining Schmalfuss with any reference which teaches another method of inspection destroys the teachings of Schmalfuss (Br5).

We agree in this case because the whole system in Schmalfuss is based around the dot scanning method. However, the rejection is based on the collective teachings of the references. As discussed, supra, the references together would have suggested the obviousness of the subject matter of claim 30.

Appellants argue that Remy does not obtain an image of the entire bottle at one time (Br7).

We disagree. Remy suggests that an image of the whole bottle can be taken at one time because it states that "where substantially the entire inner surface of the container is illuminated at the same time, the rotation can be eliminated" (col. 2, lines 20-22) and "[t]he measuring instrument has preferably an optical system imaging the container or partial regions of the container . . ." (emphasis added) (col. 3, lines 3-5). In the preferred embodiments, several images are produced (col. 2, lines 34-37) but this does not negate the teaching that the image of the container can be produced. Remy discusses that measuring an area is faster than the prior art method of successively illuminating spots and then rotating the vessel (col. 2, lines 10-19). Furthermore, one

of ordinary skill in the testing art would have recognized that whether or not the whole object can be imaged depends on the size and shape of the object and on the type of imaging device (i.e., an array of photocells can be arranged around an object while a Vidicon tube cannot because it is flat).

It is argued that Wagner requires two different illuminations and subsequent digital processing in order to detect the differences between the two images produced by the illuminations (Br7-8).

This is true. However, claim 30 does not positively recite what image processing is done and does not exclude the processing discussed in Wagner.

Appellants argue (Br8):

> Furthermore, unobviousness may reside in the discovery of the problem, the solution of which employs a combination of old elements. In re Sponnoble, (CCPA 1969) 405 F2d 578, 160 USPQ 237. None of the cited references recognize the problems of prior contact lens inspection art, namely, the need to bring inspection time to an absolute minimum. This proposition is supported by the fact that **Schmalfuss '139** does not suggest dark field illumination and, perhaps more importantly, suggests the slow process of recording thousands of individual points by dot scanning. Neither **Wagner '442** nor **Remy '806** deal with inspection of optical components, and therefore, could not recognize the problems inherent in the stringent quality requirements and production cycle times of contact lenses. [Emphasis in original.]

Remy teaches that the prior art methods of illuminating spots or regions on the container successively while rotating the beam during measurement "is time-consuming and is therefore not suitable for control measurements which are to keep pace with the high-speed of modern bottle washing and filling plants which process up to 15 bottles per second" (col. 2, lines 16-19). Thus, Remy clearly recognizes the need for speed in testing if such was not already notoriously well known to those of ordinary skill in all manufacturing arts. We disagree with Appellants' argument that they discovered the need to inspect quickly.

It is argued that secondary indicia of non-obviousness includes the prior art teaching away from the substitution, combination or modification and Schmalfuss teaches away from the claimed invention, which supports the conclusion of non-obviousness (Br9).

While we consider "teaching away" as part of the finding of the "content of the art," i.e., the content of the art as a whole must be considered, rather than objective evidence of nonobviousness, Schmalfuss is relied on only for its teaching of testing optical components.

For the reasons discussed above, we sustain the rejection of claims 30-37 and 39-43.

Claims 25-29 and 44

Appellants argue (Br7) that claim 44 requires "determining the image area of flaws in said component" (step d) and "comparing said flaw image area with one or more threshold values during image analysis" (step e), which steps are not taught by Schmalfuss.

The Examiner finds (at EA5) these limitations in figure 1, elements 10 and 22, and column 4, lines 42-43, of Schmalfuss.

We disagree with the Examiner. The signal evaluation device 10 is used for synchronization between the scanner and stepper motor and produces a signal proportional to the image dot pulse (col. 3, lines 35-44). The computer 22 evaluates the signals. However, Schmalfuss does not measure the image area of flaws or compare the flaw image area with a threshold value. At each of the 4096 radial steps, the output fault signal is fed to a threshold stage, which splits the signal according to four adjustable digital thresholds, and the split signals are fed to counters in the 64 sector counters (col. 4,

lines 3-11). Thus, there are four pixel totals for each sector (one for each range between threshold values) (col. 4, lines 12-15). The pixel totals are dependent on the number (from the four counters per sector), the location (i.e., which of the 64 sectors), and the gray tone distribution (i.e., one of four levels) of the fault signals (col. 4, lines 15-17). The analysis does not compute the area, i.e., the number of contiguous pixels. Neither Remy nor Wagner discloses computing the area. For this reason, we conclude the Examiner has failed to establish a prima facie case of obviousness with respect to claim 44. The rejection of claim 44 and 25-27 is reversed. Fitzmorris does not cure the deficiencies with respect to Schmalfuss, Remy, and Wagner. Accordingly, the rejection of claims 28 and 29 is also reversed.

CONCLUSION

The rejections of claims 30-37 and 39-43 are sustained.

The rejections of claims 44 and 25-29 are reversed.

No time period for taking any subsequent action in connection with this appeal may be extended under 37 CFR § 1.136(a).

AFFIRMED-IN-PART

KENNETH W. HAIRSTON Administrative Patent Judge	)
LEE E. BARRETT Administrative Patent Judge	) BOARD OF PATENT APPEALS AND INTERFERENCES
JOSEPH F. RUGGIERO Administrative Patent Judge	)

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